REMARKS

Claims now presented for prosecution in this Application are claims 1-6, 9, 11-16, 29, 30 and 32, claims 7, 8, 10 and 31 being canceled by the present amendment. Claims 1-16 and 29-32 have been rejected over cited prior art. Claims 1-16 and 29-32 have also been rejected over in view of Applicant's remarks below, Applicant respectfully submits that claims 1-6, 9, 11-16, 29, 30 and 32 are now in condition for allowance. Accordingly, Applicant respectfully requests that the present Response be considered and entered, the rejections to the claims be withdrawn, and that the case now be passed to issue.

The 35 U.S.C. § 112 First Rejection of Claims 1-16 and 29-32

The Examiner has rejected claims 1-16 and 29-32 as containing subject matter that was not described in the specification in such a way as to convey to one of ordinary skill in the art that the inventors had possession of the claimed invention at the time the application was filed. In particular, the Examiner has asserted that the limitation that the wafer contact surface is "less than or substantially equal to 1/2 the surface area of the wafer", finds no support in the specification.

In response, Applicant asserts that the drawings figures of the present application are considered part of the specification, for purposes including basing claims thereon, as originally filed. Moreover, Applicant further asserts that when the drawing figures and specification are read together as a whole, it would be obvious to one of ordinary skill in the art that Applicant's ceramic arms supporting the wafers do so having a contact surface that is less than or substantially equal to 1/2 the surface area of the wafer. As such, Applicant asserts that the recitation of this limitation is adequately supported by the specification, including drawing figures, as originally filed.

Without, however, conceding to the validity of the Examiner's position in this regard, Applicant has amended independent claims 1 and 30 in an effort to advance prosecution. More specifically, Applicant has amended claims 1 and 30 by removing the

above-referenced limitation from claims 1 and 30. Applicant therefore respectfully requests that the outstanding 35 U.S.C. 112 first paragraph rejection of claims 1-16 and 29-32 now be withdrawn.

The 35 U.S.C. § 102(b) Rejection of Claims 1-2, 4-6, 11-15, 29-30 and 32 over Hengst ('666)

The Examiner has rejected claims 1-2, 4-6, 11-15, 29-30 and 32 as being anticipated by Hengst. Applicant traverse this rejection and respectfully assert that Hengst does not disclose or render obvious at least each and every element of newly amended independent claims 1 and 30.

As discussed in Applicant's specification, the present invention is directed towards a wafer boat having a coating applied thereto which is capable of substantially eliminating the migration of impurities from the wafer boat to the wafers, as well as substantially eliminating 'slip' of the wafer, in particular the incidence of frictional slip in the wafer.

As amended, claim 1 now recites, in pertinent part:

"a ceramic coating disposed on a surface of the wafer support structure, the ceramic coating having an impurity migration preventing thickness that is substantially between 30 to 60 microns and a wafer contact surface, the wafer contact surface having a post coating surface finish;

wherein the post coating surface finish of the wafer contact surface substantially prevents frictional slip in the silicon wafers and is less than or substantially equal to 0.4 micron."

Similarly, claim 30 as amended now recites, in pertinent part:

"a ceramic coating disposed on a surface of the wafer support structure, the ceramic coating having an impurity migration preventing thickness that is substantially between 30 to

40 microns and a wafer contact surface, the wafer contact surface having a post coating surface finish;

wherein the post coating surface finish is less than or substantially equal to 0.4 micron."

As now amended, independent claims 1 and 30 now clearly recite the preferred thickness range of the ceramic coating applied to the ceramic arms of the wafer boat, as well as specifying the preferred post coating surface finish.

Applicant asserts that Hengst does not disclose, at least, the preferred thickness range of the ceramic coating applied to the ceramic arms of the wafer boat, as now recited in independent claims 1 and 30. Therefore, Applicant respectfully submits that an anticipatory rejection of claims 1 and 30, including those claims dependent thereon, is untenable as not showing each and every aspect of independent claims 1 and 30.

Applicant respectfully requests that the outstanding anticipatory rejection of claims 1-2, 4-6, 11-15, 29-30 and 32 be withdrawn on this basis alone.

Although Applicant believes that Hengst cannot support an anticipatory rejection for at least the reasons mentioned above, Applicant also submits that Hengst does not disclose the preferred post coating surface finish of 0.4 micron, as newly recited in independent claims 1 and 30.

In particular, although Hengst does disclose that a surface roughness of *"no more than 1"* micron helps minimize slip-inducing stress, Applicant asserts that: 1) Hengst is discussing gravitational slip and not frictional slip; and 2) Hengst does not disclose Applicant's recited range (*'less than or substantially equal to 0.4 micron*) with "sufficient specificity to constitute an anticipation under the statute", as expressed in MPEP § 2131.03.

With respect to the first point, Applicant notes that Hengst is specifically concerned with gravitational slip of the wafer due to the sagging frequently occurring at the inner portions of a wafer due to the high temperatures of the furnace (see

Hengst, e.g., column 2, lines 22-30). Indeed, Hengst's major focus is concerned with forming a downsloping edge to the arms supporting the wafers, and thereby counter-intuitively reducing the amount of such gravitational slip experienced by the wafer (see, again, Hengst, column 2, lines 22-30 and lines 40-48). Given that Hengst was chiefly - and apparently solely - concerned with gravitational slip of the wafer as it sagged under its own weight during furnace heating, and not to the problem of frictional slip, Applicant asserts that Hengst's disclosure on this point is not translatable to Applicant's independent claims which are specifically directed towards addressing frictional slip of the wafers. That is, there is no apparent recognition in Hengst that *frictional* slip could be addressed by modifying the smoothness of the coatings applied to the arms of the wafer boat.

With respect to the second point, Applicant asserts that Hengst's disclosure of a desired smoothness of "no more than 1" micron, defines only broadly a desired range and does not, therefore, recognize the added benefits noted by Applicant in having the smoothness of any such coating being in accordance with independent claims 1 and 30. That is, as expressed in MPEP § 2131.03, Hengst does not disclose Applicant's claimed range (*less than or substantially equal to 0.4 micron*) with sufficient specificity to read upon such a range. Indeed, Hengst specifically notes that "[i]f the smoothness ... is about 2 [microns], ... this ... will cause slip", and therefore Hengst cautiously remarks that "no more than 1" micron is desired. It is therefore clear that Hengst was chiefly concerned with a smoothness over 2 microns, advised a smoothness of 'no more than' 1 micron, but certainly never contemplated the specific beneficial aspects of a coating having a smoothness of 'less than or substantially equal to 0.4 microns'. Thus, Applicant contends that while Hengst may well have recognized the benefits in reducing *gravitational* slip by having a surface smoothness of the wafer arms at 'no more than' 1 micron, Hengst lacks the required sufficient specificity in the recited range to read upon Applicant's recited smoothness.

Should the Examiner disagree on this point, Applicant respectfully requests that the Examiner specifically address MPEP § 2131.03 and how Hengst discloses Applicant's

claimed range (*less than or substantially equal to 0.4 micron*) with sufficient specificity to read upon such a range.

Applicant therefore believes that Hengst cannot now anticipate the claimed configuration of elements as recited in, at least, independent claims 1 and 30. Applicant respectfully requests withdrawal of the 35 U.S.C. § 102(b) rejection with respect to independent claims 1 and 30, as well as the claims dependent therefrom.

Applicant earnestly believes that claims 1 and 30 now clearly define over Hengst and the other cited prior art of record, however, should the Examiner believe that there remains any outstanding issues, Applicant respectfully requests that the Examiner contact Applicant's Representative so as to expedite resolution of these outstanding issues.

The 35 U.S.C. § 103(a) Rejection of Claims 1-6, 9-16 and 29-32 over Inaba in view of Wingo

The Examiner has rejected claims 1-6, 9-16 and 29-32 as being obvious over Inaba in view of Wingo. Applicant traverses this rejection and respectfully assert that neither Inaba nor Wingo, alone or in combination, disclose or render obvious at least each and every aspect of newly amended independent claims 1 and 30.

As discussed above, claim 1 now recites, in pertinent part:

"a ceramic coating disposed on a surface of the wafer support structure, the ceramic coating having an impurity migration preventing thickness that is substantially between 30 to 60 microns and a wafer contact surface, the wafer contact surface having a post coating surface finish;

wherein the post coating surface finish of the wafer contact surface substantially prevents frictional slip in the silicon wafers and is less than or substantially equal to 0.4 micron."

Similarly, claim 30 as amended now recites, in pertinent part:

"a ceramic coating disposed on a surface of the wafer support structure, the ceramic coating having an impurity migration preventing thickness that is substantially between 30 to 40 microns and a wafer contact surface, the wafer contact surface having a post coating surface finish;

wherein the post coating surface finish is less than or substantially equal to 0.4 micron."

As now amended, independent claims 1 and 30 now clearly recite the preferred thickness range of the ceramic coating applied to the ceramic arms of the wafer boat, as well as specifying the preferred post coating surface finish.

Applicant asserts that Inaba does not disclose, at least, the preferred thickness range of the ceramic coating applied to the ceramic arms of the wafer boat, as now recited in independent claims 1 and 30, Wingo adding no pertinent disclosure in this regard. Therefore, Applicant respectfully submits that a rejection based upon Inaba in view of Wingo is untenable as not showing each and every aspect of independent claims 1 and 30.

Applicant respectfully requests that the outstanding rejection of claims 1-6, 9-16 and 29-32 be withdrawn on this basis alone.

Moreover, Applicant notes the Examiner's assertion that Inaba discloses "having a ceramic coating to prevent migration of impurities (Col 1 line 20)", but no such disclosure was identified by Applicant. Clarification on this point is requested.

With reference to the *'post coating surface finish being less than or substantially equal to 0.4 micron'*, as recited in claims 1 and 30, Applicant asserts that, pursuant to MPEP § 2144.05 (III), Inaba simply does not recognize the criticality of this parameter and actually teaches away from the range recited in claims 1 and 30.

Applicant agrees that although Inaba mentions the desire to maintain 'a maximum surface roughness below 10 microns', Inaba clearly does not recognize the criticality of this range and teaches away from the same, as expressed in values utilized in Inaba's various examples. In particular, Inaba's Tables II and III illustrate that not only did Inaba's 'present invention' never utilize a smoothness below 2.0 microns, but Inaba explicitly states that "it is clear that it is at 10 [microns] or therebelow... that the surface is smoothed fairly uniformly" (column 6, lines 1-54).

Moreover, column 7, lines 33-36, and column 8, lines 26-28 of Inaba explicitly state that Inaba considers smoothing the surface down to 10 microns to be an acceptable amount. Clearly, then, Inaba never contemplates - in the drawings, the specification or any of the examples or tables disclosed therein - a post coating surface finish that is less than or substantially equal to 0.4 micron, as explicitly recited by Applicant in claims 1 and 30.

Thus, Applicant strongly assert that, pursuant to MPEP § 2144.05 (III), Inaba cannot anticipate or render obvious the range recited in claims 1 and 30 as Inaba clearly never appreciated the criticality of a smoothness in the range of 0.4 microns or less. Moreover, again pursuant to MPEP § 2144.05 (III), Applicant asserts that Inaba does, in fact, teach away from a smoothness of 0.4 or less by never reciting or contemplating a smoothness of less than 2.0 microns in any table, example or disclosure.

Should the Examiner disagree on this point, Applicant respectfully requests that the Examiner specifically address MPEP § 2144.05 (III) and specifically point out how Inaba can be held to recognize the criticality of a smoothness at or below 0.4 microns, as explicitly recited in claims 1 and 30, without any reference to such a range in any examples, figures, tables or related disclosure. Further, Applicant respectfully requests that the Examiner specifically address Inaba's teaching away from the smoothness range recited by Applicant, as reflected by Inaba's satisfaction at rendering the smoothness of the surface to 10 microns (e.g., column 8, lines 25-28).

Applicant therefore believes that Inaba in view of Wingo cannot render obvious the claimed configuration of elements as recited in, at least, independent claims 1 and 30. Applicant therefore respectfully requests withdrawal of the 35 U.S.C. § 103(a) rejection with respect to independent claims 1 and 30, as well as to those claims depending therefrom.

Applicant earnestly believes that claims 1 and 30 now clearly define over both Inaba and Wingo, however, should the Examiner believe that there remains any outstanding issues, Applicant respectfully requests that the Examiner contact Applicant's Representative so as to expedite resolution of these outstanding issues.

The 35 U.S.C. § 103(a) Rejection of Claims 7 and 8 over Inaba in view of Lu

The Examiner has rejected claims 1-6, 9-16 and 29-32 as being obvious over Inaba in view of Lu. Applicant traverse this rejection and respectfully assert that neither Inaba nor Lu, alone or in combination, disclose or render obvious at least each and every aspect of newly amended independent claims 1 and 30.

As discussed above, claim 1 now recites, in pertinent part:

"a ceramic coating disposed on a surface of the wafer support structure, the ceramic coating having an impurity migration preventing thickness that is substantially between 30 to 60 microns and a wafer contact surface, the wafer contact surface having a post coating surface finish;

wherein the post coating surface finish of the wafer contact surface substantially prevents frictional slip in the silicon wafers and is less than or substantially equal to 0.4 micron."

Similarly, claim 30 as amended now recites, in pertinent part:

"a ceramic coating disposed on a surface of the wafer support structure, the ceramic coating having an impurity migration preventing thickness that is substantially between 30 to

40 microns and a wafer contact surface, the wafer contact surface having a post coating surface finish;

wherein the post coating surface finish is less than or substantially equal to 0.4 micron."

As now amended, independent claims 1 and 30 now clearly recite the preferred thickness range of the ceramic coating applied to the ceramic arms of the wafer boat, as well as specifying the preferred post coating surface finish.

As mentioned previously, Inaba does not disclose, at least, the preferred thickness range of the ceramic coating applied to the ceramic arms of the wafer boat, as now recited in independent claims 1 and 30. The Examiner has cited Lu for this missing aspect. Applicant respectfully traverse this interpretation of Lu.

With reference to Lu, column 6, lines 21-23, in which the Examiner indicates that Lu teaches a "SiC coating ... being 100 [microns] or less", Applicant has the following comments:

1) This passage does *not* state that Lu, in fact, utilizes a coating of such a thickness. In contrast, this passage merely states that "SiC carbide coatings are well known having thicknesses of 100[microns] or less", in the context of "fields outside of semiconductor fabrication equipment". This passage specifically refers to patent '526 issued to Itoh, drawn to resistive heaters, and patent '418 issued to Hotate for rugged mirrors (as also, and previously, referenced in column 4, lines 29-35).

2) The above-referenced passage goes on to state, "but the CVD films of 1mm or more envisioned in many of the embodiments of the inventions are believed to be novel" (column 6, lines 22-24). That is, column 6, lines 14-24 speak, in their totality, of other applications in 'fields outside of semiconductor fabrication equipment' in which coatings of SiC are utilized in thicknesses of 100 microns or less. In addition, Lu most notably explicitly states that CVD films of 1mm or more are utilized in many of Lu's embodiments.

3) Column 7, lines 38-39 support this reading of Lu by stating that, in Experiment 2, Lu deposits "a thick layer of up to 6mm of silicon carbide deposited by CVD". Also recited in column 12, line 44, another of Lu's examples recites the "CVD film ... had a thickness of 2.5mm".

Thus, Applicant asserts that Lu simply does not teach utilizing a coating having a thickness of 100 microns or less. Rather, Lu's only examples all indicate thicknesses of 2.5mm or 6mm for such a coating. Even Lu's recitation that SiC carbide coatings are well known having thicknesses of 100 microns or less was in the context of "fields outside of semiconductor fabrication equipment", and therefore not applicable to the subject matter of the present invention.

Applicant therefore believes that Inaba in view of Lu cannot render obvious the claimed configuration of elements as recited in, at least, independent claims 1 and 30. Applicant therefore respectfully requests withdrawal of the 35 U.S.C. § 103(a) rejection with respect to independent claims 1 and 30, as well as to those claims depending therefrom.

Should the Examiner contest this interpretation of Lu, the Examiner is respectfully requested to illustrate where in Lu it is disclosed that the coating may be between 30-60 microns in thickness, as explicitly claimed in claim 1, or between 30-40 microns as explicitly recited in claim 30. Moreover, the Examiner is respectfully requested to address the entire paragraph from which the quoted passage was taken, and the explicit disclosure that Lu's embodiments involve CVD deposited films of 1mm or more, as expressed in the examples in column 7, lines 38-39 and column 12, line 44.

CONCLUSION

In view of the remarks above, it is respectfully submitted that claims 1-6, 9, 11-16, 29, 30 and 32 are allowable, and an early action to that effect is earnestly solicited.

The Examiner is invited to contact the undersigned at the number below to expedite resolution of any issues that the Examiner may consider to remain unresolved. In particular, should a Notice of Allowance not be forthcoming, the Examiner is requested to phone the undersigned for a telephonic interview, an Examiner's amendment, or the like, while the outstanding issues are fresh in the mind of the Examiner.

It is believed that no additional fees or deficiencies in fees are owed. However, authorization is hereby given to charge our Deposit Account No.13-0235 in the event any additional fees are owed.

Respectfully submitted,

By _____
Nicholas J. Tuccillo
Registration No. 44,322
Attorney for Applicant

McCORMICK, PAULDING & HUBER LLP
CityPlace II, 185 Asylum Street
Hartford, CT 06103-4102
Tel.: (860) 549-5290
Fax: (860) 527-0464